Application No.: 10/627,232   Docket No.: 02-050

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) An implantable neurostimulator comprising:

a microprocessor;

a pulse generator that outputs at least two sets of electrical stimulation pulses in a substantially concurrent and interleaved manner having differing characteristics, wherein each set of stimulation pulses are associated with a unique stimulation setting such that the at least two sets of electrical stimulation pulses have differing characteristics, and wherein the pulse generator generates its outputs as directed by the microprocessor in accordance with at least one repetition parameter associated with each unique stimulation setting, and wherein the at least one repetition parameter defines a number of pulses to be generated for one of the at least two sets of electrical stimulation pulses within a stimulation cycle independent from one or several pulse frequency parameters defined for the at least two sets of electrical stimulation pulses; and

at least one implanted lead electrically coupled to the output of the pulse generator that delivers the at least two sets of stimulation pulses with at least one electrode, to living tissue proximate to the at least one electrode.

2. (Original) The implantable neurostimulator of Claim 1, wherein at least one skipping parameter is associated with each unique stimulation setting, and wherein the microprocessor causes the pulse generator to skip a portion of a set of electrical stimulation pulses for a predetermined number of cycles in accordance with the at least one skipping parameter.

3. (Original) The implantable neurostimulator of Claim 1 wherein the at least one electrode further comprises a plurality of individual electrodes, and wherein each unique stimulation settings employs a combination of individual electrodes, and wherein the combination of individual electrodes employed by each unique stimulation setting may differ.

2

Application No.: 10/627,232   Docket No.: 02-050

4. (Original) The implantable neurostimulator of Claim 1 wherein each set of stimulation pulses associated with a unique stimulation setting have differing pulse characteristics.

5. (Original) The implantable neurostimulator of Claim 1, wherein the living tissue comprises nerve tissue.

6-12. (Cancelled)

13. (Currently Amended) A method for stimulating living tissue(s) with an implantable neurostimulator having a set of stimulation settings, wherein each stimulation setting delivers electrical pulses with defined pulse characteristics to a set of electrodes, comprising the steps of:

selecting a first stimulation setting from the set of stimulation settings;

generating a first set of repeating electrical pulses according to the selected first stimulation setting wherein the selected first stimulation setting describes a repetition pattern for the repeating electrical pulses;

delivering the first set of electrical pulses to the living tissue(s) according to the selected first stimulation settings to repeatedly stimulate the living tissue(s);

selecting at least one additional stimulation setting from the set of stimulation settings;

generating a second set of repeating electrical pulses according to the at least one additional selected stimulation settings wherein the at least one additional selected stimulation setting describes a repetition pattern for the second set of repeating electrical pulses;

delivering the second set of electrical pulses to the living tissue(s) according to the selected stimulation setting to further repeatedly stimulate the living tissue(s);

wherein the selecting, generating, and delivering of the first and second sets of electrical pulses occurs in an interleaved and substantially concurrent manner and wherein the repetition patterns define a number of pulses to be generated according to the first and second stimulation settings during pulse interleaving independent from one or several pulse frequency parameters defined for the first and second sets of electrical pulses.

3

14. (Original) The method of Claim 13, further comprising the step of skipping at least one stimulation setting for a predetermined number of cycles in accordance with at least one skipping parameter.

15. (Original) The method of Claim 13, wherein each stimulation settings employs a combination of individual electrodes selected from the set of electrodes, and wherein the combination of individual electrodes employed by stimulation settings differ.

16. (Original) The method of Claim 13 wherein each stimulation settings employs differing pulse characteristics.

17. (Original) The method of Claim 13 wherein the steps are implemented by instructions executed by a microprocessor.

18. (Original) The method of Claim 13 wherein the steps are implemented by instructions executed by hardware.

19-23. (Cancelled)

4

Application No.: 10/627,232   Docket No.: 02-050

24. (Currently Amended) A method for stimulating living tissue(s) with an electrical neurostimulator stimulator, the method comprising:

maintaining a plurality of stimulation sets of stimulation parameters with each set of stimulation parameters defining at least a pulse characteristic and an electrode configuration in memory of the implantable stimulator neurostimulator;

maintaining a repetition parameter for at least one of the plurality of stimulation sets in memory of the implantable stimulator neurostimulator; and

stimulating living tissue(s) using a substantially continuous set of pulses wherein the stimulating includes by (i) successively selecting a stimulation set from the plurality of stimulation sets in a cyclical manner; (ii) generating a pulse according to the pulse characteristic of the selected stimulation set; and (iii) delivering the generated pulse to living tissue(s) through electrodes according to the electrode configuration of the selected stimulation set;

wherein the stimulating repeats the generating and delivering for the at least one of the plurality of stimulation sets according to the repetition parameter within each stimulation cycle independent from one or several frequency parameters associated with the plurality of stimulation sets.

25. (Previously Presented) The method of claim 24 further comprising:

maintaining a skipping parameter for a second stimulation set of the plurality of stimulation sets;

wherein the stimulating omits performing the generating and delivering for the second stimulation set for a number of consecutive cycles within a predetermined number of cycles according to the skipping parameter.

26. (Previously Presented) The method of claim 24 wherein the pulse characteristic is a pulse amplitude.

27. (Previously Presented) The method of claim 24 wherein the pulse characteristic is a pulse width.

5

Application No.: 10/627,232   Dockct No.: 02-050

28. (Currently Amended) An electrical neurostimulator stimulator for stimulating living tissue, comprising:

memory storing a plurality of stimulation sets of stimulation parameters with each set of stimulation parameters defining at least a pulse characteristic and an electrode configuration;

the memory further storing a repetition parameter for at least one of the plurality of stimulation sets;

a pulse generator that outputs a pulse having a pulse characteristic; and

a microprocessor operating under executable instructions that:

(i) successively selects a stimulation set from the plurality of stimulation sets in a cyclical manner;

(ii) loads the pulse characteristic into a pulse control associated with the pulse generator;

(iii) configures an output switch matrix according to the electrode configuration of the selected stimulation set;

(iv) causes the pulse generator to output at least one pulse after the loading and configuring, wherein the microprocessor causes the pulse generator to generate adjacent pulses according to a frequency parameter; and

(v) when the selected stimulation set is the at least one stimulation set associated with the repetition parameter, repeating (iv) according to the repetition parameter within a stimulation cycle independent from the frequency parameter.

29. (Currently Amended) The electrical neurostimulator stimulator of claim 28 wherein the memory further stores a skipping parameter for a second stimulation set of the plurality of stimulation sets; and

wherein the microprocessor is further operable to omit selecting the second stimulation set for a number of consecutive cycles within a predetermined number of cycles according to the skipping parameter.

30. (Currently Amended) The electrical neurostimulator stimulator of claim 28 wherein the pulse characteristic is a pulse amplitude.

6

Application No.: 10/627,232 Docket No.: 02-050

31. (Currently Amended) The electrical neurostimulator ~~stimulator~~ of claim 29 wherein the pulse characteristic is a pulse width.

7